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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/834,040	04/12/2001	DeWitt C. Seward IV	301493.1001-001	1765
30407	7590	04/20/2004	EXAMINER	
BOWDITCH & DEWEY, LLP 161 WORCESTER ROAD P.O. BOX 9320 FRAMINGHAM, MA 01701-9320			KERVEROS, JAMES C	
			ART UNIT	PAPER NUMBER
			2133	19

DATE MAILED: 04/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/834,040

Applicant(s)

SEWARD ET AL.

Examiner

James C Kerveros

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 March 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-45 is/are pending in the application.
- 4a) Of the above claim(s) 1-4 and 9-39 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 5-8 and 40-45 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 April 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on March 8, 2004 has been entered.

Response to Election/Restrictions

Applicant's election without traverse of Group I, Species B, claims 5-8 in Paper No. 10 is acknowledged. Claims 1-4 and 9-39 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim. Election was made **without** traverse in Paper No. 10.

Claims 1-45 are pending in the application.

Claims 5-8 and 40-45 are presented for examination.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the

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applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 5 are rejected under 35 U.S.C. 102(e) as being anticipated by Nagata et al. (US 6396288), filed: September 8, 1999.

Regarding Claim 5, Nagata discloses a dielectric resonator device having a plane being close to a sample for measuring the dielectric properties of the sample, comprising:

A container, such as a cylindrical shield case (35, FIG. 8), which has a material (sample, 48, FIG. 14) placed within the shield case (35) on the opening part.

A microwave source (oscillator, 26, FIG. 3A).

An antenna (dielectric resonator 20) having a plurality of resonant modes coupled to the microwave source (26) through the loop antennas (22a, 22b) connected with respective connectors (34a, 34b) through the semi-rigid cables (36a, 36b) and connected to an oscillator, FIG. 8.

The antenna 20 generates an electromagnetic signal with polarization components, such as Traverse Electric and Magnetic fields, TM or TE mode originating from the source 26, when the dielectric resonator 20 is square, and an HEM mode when the antenna is cylindrical.

The antenna (resonator 20) is spaced apart from the material (sample, 48) within the container 35, with an air gap space between the sample and the antenna (resonator

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20), as shown in more detailed in FIG. 14, for measuring the dielectric property of the sample.

A microwave detector (28, FIG. 3) for detecting microwave intensity which is the signal magnitude, and the variance of the resonance frequency which is measured as the frequency shift quantity and which by definition is proportional to the phase shift, ($F=1/2\pi\omega$), where ω is the phase angle.

Regarding Claim 8, a square resonator whose sample measuring surface is square or rectangular as the dielectric resonator, where linear bar-like rod antennas are superior to loop antennas in uniformity of directions of electric field vectors in a measured in-sample plane as terminals of a microwave exciter and a detector. This is described with reference to FIG. 16 to FIG. 20.

Regarding Claim 42, Nagata discloses a circularly polarized antenna (dielectric resonator 20), which generates polarization components, such as an HEM mode when the antenna is cylindrical.

Regarding Claim 43, Nagata discloses two different resonant frequencies, (FIG.10A) shows a resonance peak at a microwave frequency of 5070.2 MHz, when placing no sample and (FIG. 10B) shows a resonance frequency in the case of placing a sheet of paper as the sample, since the resonance frequency varies when the sample or resonator (20) is rotated and also by the dimensions and the dielectric constant of the dielectric resonator 20.

Regarding Claim 44, Nagata discloses directional coupler (34a) between the source oscillator 26 and the antenna dielectric resonator 20.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 40 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagata et al. (US 6396288).

Regarding Claims 40 and 41, Nagata does not disclose bottle container containing fluid to be measured. However, he discloses a dielectric resonator device including a container cylindrical case (35, FIG. 8), which contains a sample (48, FIG. 14), for measuring the dielectric property of the sample, such as a polymer sheet including a film and paper and stereoscopic articles such as moldings of plastic, resin, rubber using microwave, where the solid polymer is solidified from a fluid or liquid state. It would have been obvious to a person having ordinary skill in the art at the time the invention was made to add a fluid sample in the container of Nagata for the purpose of measuring the dielectric property of the fluid, since the dielectric resonator device of Nagata measures a sample in a solid or liquid state.

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nagata et al. (US 6396288) in view of Michaels in (US 5371505).

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Regarding Claim 6, Nagata does not disclose a radome defining the air gap between the antenna and the material. A radome is well known protective housing used to house radar antenna, as defined by Webster's Dictionary. Further, Michaels in (US 5371505) discloses a radome 10, which creates an air gap between an antenna 12 housed inside the radome and a material (reflector 14), as shown Figure 1. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to house the antenna (dielectric resonator 20) of Nagata with the radome, as taught by Michaels, for the purpose of maintaining a dielectric air gap between the material and the antenna, since the spacing of material from the radome wall is successively changing where the received data for the material is used to derive signal transmission characteristics.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nagata et al. (US 6396288) in view of Davidov (US 5781018).

Regarding Claim 7, Nagata does not explicitly define air gap spacing within 2.5λ of the sensor. However, Nagata defines an air gap space between the sample and the antenna (resonator 20), as shown in more detailed in FIG. 14, for measuring the dielectric property of the sample. Further, in an analogous art, Davidov defines an air gap between the antenna and the material to "be limited to not substantially more $\lambda/10$ ", where λ is the free-space microwave wavelength λ_0 reduced to account for the dielectric constant of the spacing (Column 7, line 41-46). It would have been obvious to a person having ordinary skill in the art at the time the invention was made to select a microwave

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wavelength λ_0 parameter representing the free-space, as taught by Davidov, which would be a suitable air gap space between the sample and the antenna of Davidov, so as to perform reliable dielectric measurement of the sample taking into consideration the dielectric constant of free-space.

Response to Arguments

Applicant's arguments with respect to claims 5-8 and 40-45 have been considered but are moot in view of the new ground(s) of rejection.

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Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James C Kerveros whose telephone number is (703) 305-1081. The examiner can normally be reached on 9:00 AM TO 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Albert Decady can be reached on (703) 305-9595. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

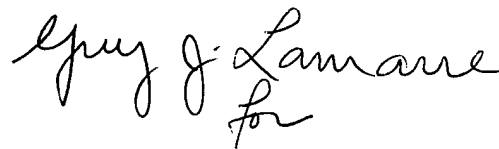
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U.S. PATENT OFFICE
Examiner's Fax: (703) 746-4461
Email: james.kerveros@uspto.gov

Date: 8 April 2004
Office Action: Non-Final Rejection

By: 

James C Kerveros
Examiner
Art Unit 2133



Albert DeCady
Primary Examiner